

**Abstract**

An optical transmission system includes a transmitter unit, a receiver unit, and an optical transmission path interconnecting the transmitter and receiver units. A plurality of optical repeaters are situated along the transmission path. Adjacent ones of the repeaters are interconnected by transmission spans that collectively constitute a majority of the optical transmission path. Each of the transmission spans comprises substantially identical lengths of cabled optical fiber having substantially identical prescribed path average dispersions. At least one adjustable dispersion trimming element is located in the optical repeater and optically couples one of the transmission spans to an optical amplifier located in the repeater. The adjustable dispersion trimming element has an adjustable path average dispersion selected such that a total path average dispersion of the transmission span to which it is coupled plus the adjustable dispersion trimming element has a desired value.